

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - MAIN PROP. FMEA NO 05-6J -2226 -2 REV:04/25/88

ASSEMBLY :AFT LCA-3 CRIT. FUNC: 1R  
P/N RI :MC477-0261-0002 CRIT. HDW: 3  
P/N VENDOR:  
VEHICLE 102 103 104  
EFFECTIVITY: X X X  
PHASE(S): PL LO X OO DO LS  
QUANTITY :1  
:ONE  
:

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS  
PREPARED BY: APPROVED BY: APPROVED BY (NASA):  
DES J BROWN DES R. Carson EPDC SSM [Signature] 5-12-88  
REL F DEFENSOR [Signature] REL M. Chilton 5-6-88 EPDC REL [Signature] 5-13-88  
QE D. Masai QE G. J. Carson 5-6-88 MPS REL [Signature] 5-13-88  
QE [Signature]

ITEM:  
CONTROLLER, HYBRID DRIVER (HDC), TYPE I, ENGINE CUTOFF (ECO) OPEN  
SIMULATION COMMAND, POINT SENSOR ELECTRONICS BOX CHECKOUT CIRCUIT.

FUNCTION:  
UPON GROUND MDM COMMAND, CONDUCTS PRE-FLIGHT TEST BUS POWER TO OPEN  
SIMULATION COMMAND INPUT OF POINT SENSOR ELECTRONICS BOX, STIMULATING ALL  
LO2/LH2 ECO WET SIGNALS. 56V76A123J6(N).

FAILURE MODE:  
INADVERTENT OUTPUT, FAILS "ON", FAILS TO TURN "OFF".

CAUSE(S):  
PIECE PART FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK,  
PROCESSING ANOMALY, THERMAL STRESS.

EFFECT(S) ON:  
(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE (E) FUNCTIONAL  
CRITICALITY  
(A) LOSS OF CAPABILITY TO REMOVE OPEN SIMULATION COMMAND BY GROUND MDM.  
(B) DEGRADATION OF REDUNDANCY AGAINST FALSE WET ECO SIGNALS.  
(C,D) NO EFFECT - FIRST FAILURE.

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- (E) 1R/3, 2 SUCCESS PATHS AFTER FIRST FAILURE. TIME FRAME - ASCENT.  
1) HDC FAILS "ON".  
2,3) DIODES FEEDING ESSENTIAL BUS FROM PRE-FLIGHT TEST BUS SHORT,  
POWERING PRE-FLIGHT TEST BUS. ALL ECO SIMULATION OPEN COMMAND IS  
SENT TO POINT SENSOR ELECTRONICS BOX PRECLUDING DRY ECO OUTPUT  
UPON PROPELLANT DEPLETION.

PROPELLANT DEPLETION MECO COMMAND CAPABILITY WOULD BE LOST. SYSTEM  
REQUIRES TWO LO2 OR TWO LH2 DRY SIGNALS AFTER ARM COMMAND BEFORE  
PROPELLANT DEPLETION SSME SHUTDOWN COMMAND CAN BE GIVEN. PROPELLANT  
STARVATION WILL RESULT IN SSME PUMP CAVITATION AND UNCONTAINED ENGINE  
DAMAGE. POSSIBLE LOSS OF CREW AND VEHICLE.

FAILS B SCREEN BECAUSE NO INSTRUMENTATION IS AVAILABLE TO DETECT FAILURE.

DISPOSITION & RATIONALE:

(A)DESIGN (B)TEST (C)INSPECTION (D)FAILURE HISTORY (E)OPERATIONAL USE

(A-D) FOR DISPOSITION AND RATIONALE:

REFER TO APPENDIX B, ITEM NO. 1 - HYBRID DRIVER CONTROLLER.

(B) GROUND TURNAROUND TEST

MPS SIG COND PWR CONTROL VERIF V41A10.080 EVERY FLIGHT.

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.

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